

**WHAT IS CLAIMED IS:**

1. A method of preparing a tissue graft comprising:

i) washing a starting tissue obtained from a human or animal ureter with a bioburden reducing agent so that said starting tissue is disinfected,

ii) decellularizing the disinfected tissue resulting from step (i) with a solution that lyses cells of said disinfected tissue so that a tissue matrix is formed, and

iii) contacting said tissue matrix resulting from step (ii) with a nuclease so that nucleic acid associated with said tissue matrix is degraded, and

iv) washing said tissue matrix resulting from (iii) so that cellular or extracellular debris is removed and said tissue graft is obtained.

2. The method according to claim 1 wherein said bioburden reducing agent is an antimicrobial agent.

3. The method according to claim 2 wherein the antimicrobial agent comprises an antibiotic.

4. The method according to claim 1 wherein said solution that lyses said cells comprises sterile water.

5. The method according to claim 1 wherein said solution that lyses said cells comprises an aqueous hypotonic buffer or low ionic strength buffer.

6. The method according to claim 1 wherein said nuclease comprises an exonuclease and an endonuclease.

7. The method according to claim 6 wherein said nuclease comprises DNase I and RNase A.

8. The method according to claim 7 wherein step (iii) comprises contacting said tissue matrix with said nuclease at 20°C to 38°C for 1 to 36 hours.

9. The method according to claim 1 further comprising, after step (iv), sterilizing said tissue matrix.

10. The method according to claim 9 wherein said sterilization is effected using gamma

irradiation, iodine, peracetic acid or electron beam.

11. The method according to claim 10 wherein said sterilization is effected using gamma irradiation.

12. The method according to claim 10 wherein said tissue matrix is maintained at a temperature between 2°C and 8°C during said sterilization.

13. The method according to claim 1 further comprising, after step (iv), cryopreserving said tissue matrix.

14. A tissue graft obtainable by the method according to claim 1.

15. A method of treating a patient having a defective tissue comprising replacing said defective tissue with an unfixed, decellularized tissue graft that is obtainable by the method according to claim 1.

16. The method according to claim 15 wherein said defective tissue has a tubular structure.

17. The method according to claim 15 wherein said tissue graft has a tubular structure.

18. The method according to claim 17 wherein said tissue graft is a vascular graft, a ureter graft or a nerve guide.

19. The method according to claim 15 wherein said tissue graft is a patch.

20. The method according to claim 19 wherein said defective tissue is skin.

21. A method of preparing a tissue graft comprising:

i) washing a starting tissue obtained from a human or animal source with a bioburden reducing agent so that said starting tissue is disinfected,

ii) decellularizing the disinfected tissue resulting from step (i) with a solution that lyses cells of said disinfected tissue so that a tissue matrix is formed,

iii) contacting said tissue matrix resulting from step (ii) with a nuclease so that nucleic

acid associated with said tissue matrix is degraded,

iv) washing said tissue matrix resulting from (iii) so that cellular or extracellular debris is removed and said tissue graft is obtained, and

v) sterilizing said tissue matrix resulting from (iv) while maintaining said tissue matrix in a non-frozen state at a temperature between 0°C and 40°C.

22. The method according to claim 21 wherein the starting tissue is ureter, vein, artery, tendon, heart valve, fascia lata, pericardium or nerve.

23. The method according to claim 22 wherein said starting tissue is ureter.

24. The method according to claim 21 wherein said bioburden reducing agent is an antimicrobial agent.

25. The method according to claim 24 wherein the antimicrobial agent comprises an antibiotic.

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26. The method according to claim 21 wherein, in step (v), said temperature is maintained between 2°C and 8°C.

27. The method according to claim 21 wherein said solution that lyses said cells comprises sterile water.

28. The method according to claim 21 wherein said solution that lyses said cells comprises an aqueous hypotonic buffer or low ionic strength buffer.

29. The method according to claim 21 wherein said solution that lyses said cells comprises a protease inhibitor.

30. The method according to claim 21 wherein said nuclease comprises an exonuclease and an endonuclease.

31. The method according to claim 30 wherein said nuclease comprises DNase I and RNase A.

32. The method according to claim 31 wherein step (iii) comprises contacting said

tissue matrix with said nuclease at 20°C to 38°C for 1 to 36 hours.

33. The method according to claim 21 wherein step (iv) comprises washing said tissue matrix at 2°C to 42°C for up to 7 days.

34. The method according to claim 21 wherein said sterilization is effected using gamma irradiation, iodine, peracetic acid or electron beam.

35. The method according to claim 34 wherein said sterilization is effected using gamma irradiation.

36. The method according to claim 21 further comprising, after step (iv) and before step (v), or after step (v), cryopreserving said tissue matrix.

37. The method according to claim 21 wherein, after step (v), said tissue matrix is maintained at about 25°C prior to implantation.

38. A tissue graft obtainable by the method according to claim 21.

39. The tissue graft according to claim 38 wherein the starting tissue is ureter.

40. A method of treating a patient having a defective tissue comprising replacing said defective tissue with an unfixed decellularized tissue graft that is obtainable by the method according to claim 21.

41. The method according to claim 40 wherein said defective tissue has a tubular structure.

42. The method according to claim 40 wherein said defective tissue has a tubular structure.

43. The method according to claim 40 wherein said tissue graft has a tubular structure.

44. The method according to claim 43 wherein said tissue graft is a vascular graft, a ureter graft or a nerve guide.

45. The method according to claim 40 wherein said tissue graft is a patch.

46. The method according to claim 45  
wherein said defective tissue is skin.